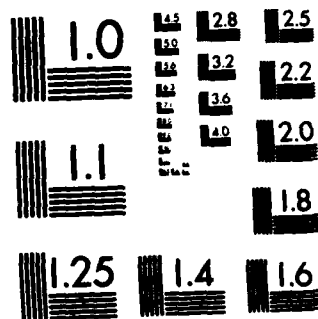


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that by channeling our country's technological prowess toward building a near impenetrable strategic defense umbrella a more stable and secure world would result.

This study looks at the Strategic Defense Initiative (SDI) and how it will achieve the objectives President Reagan envisioned in his speech. It does this by examining a scenario in which deterrence has failed and the time for Presidential decision making is severely compressed. It continues by looking at Presidential decision making during such a crisis and examines his options. Next, it looks at how the SDI is envisioned to work and contribute to the ultimate goal of eliminating the threat posed by nuclear ballistic missiles. Last, it examines the possibility that the SDI may create a world we do not want; a dangerous world in which conventional wars between the two superpowers would become possible, maybe even probable. It does this by examining its impact on NATO, particularly in light of the proposed Intermediate-Range Nuclear Forces (INF) treaty.

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LOOKING BEYOND THE  
STRATEGIC DEFENSE INITIATIVE

An Individual Study Project  
Intended for Publication

by

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## ABSTRACT

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On 23 March 1983, President Reagan announced to the world a new and bold proposal, that offered a promise of changing the course of human history. In his proposal, he asked the question: "What if free people could live secure in the knowledge that their security did not rest upon the threat of instant U.S. retaliation to deter a Soviet attack, that we could intercept and destroy strategic ballistic missiles before they reached our own soil or that of our allies?" President Reagan called upon the scientists of our nation to use their great scientific talents to render ballistic missiles impotent and obsolete. He felt that by channeling our country's technological prowess toward building a near impenetrable strategic defense umbrella a more stable and secure world would result.

This study looks at the Strategic Defense Initiative (SDI) and how it will achieve the objectives President Reagan envisioned in his speech. It does this by examining a scenario in which deterrence has failed and the time for Presidential decision making is severely compressed. It continues by looking at Presidential decision making during such a crisis and examines his options. Next, it looks at how the SDI is envisioned to work and contribute to the ultimate goal of eliminating the threat posed by nuclear ballistic missiles. Last, it examines the possibility that the SDI may create a world we do not want; a dangerous world in which conventional wars between the two superpowers would become possible, maybe even probable. It does this by examining its impact on NATO, particularly in light of the proposed Intermediate-Range Nuclear Forces (INF) treaty.



## INTRODUCTION

In 1983, President Reagan announced to the world that the United States was embarking on a bold, new and controversial defense program that would make nuclear weapons obsolete.

In his address, President Reagan proposed the following:

Let me share with you a vision of the future which offers hope. It is that we embark on a program to counter the awesome Soviet missile threat with measures that are defensive. Let us turn to the very strengths in technology that spawned our great industrial base and that have given us the quality of life we enjoy today. What if free people could live secure in the knowledge that their security did not rest upon the threat of instant U.S. retaliation to deter a Soviet attack, that we could intercept and destroy strategic ballistic missiles before they reached our own soil or that of our allies?...I call upon the scientific community in our country, those who gave us nuclear weapons, to turn their great talents now to the cause of mankind and world peace, to give us the means of rendering these nuclear weapons impotent and obsolete.

The Strategic Defense Initiative (SDI) as described by the President, is a radical shift in our nuclear strategy and will profoundly effect our relations with the Soviets. Some skeptics of the President's proposal argue that our mutual vulnerability to nuclear attack has encouraged and guaranteed peace for over forty years. Why change now? They state that any defensive system would upset the balance of mutual terror thus making nuclear conflict more likely. On-the-other-side of the argument, there are those that contend that SDI is a good thing, an extension of nuclear

deterrence; i.e., that deterrence is enhanced by a good defense. Regardless of which side you take, there are serious questions that need to be answered. One is whether the SDI will produce the stability and security President Reagan envisions or will it touch off a new and expensive arms race. Another question that needs addressing is what will happen if a strategic defense system is deployed by both the U.S. and Soviets; a defense of similar capability and one that is perceived by both parties as making strategic nuclear weapons impotent and obsolete. Would the world then be safe for lesser wars between the superpowers and does it make these wars more likely?

The paper does not argue for or against the SDI but recognizes that the SDI may be needed either for enhancing deterrence or for defense in the event deterrence fails. Regardless, it points out that the deployment of a strategic defense system might shape a world in a manner we do not want, a world in which the SDI provides an umbrella under which conventional war between the superpowers would become more likely given the right crisis or circumstance.

The following paragraphs describe an unlikely scenario, one that is terrible beyond imagination, a scenario in which deterrence has failed. It paints a desperate situation, one of supreme crisis in which the time for thinking and acting is severely compressed. It goes on to examine Presidential

options during such a crisis and questions whether he has any option at all. Next, it looks at the Strategic Defense Initiative and its impact on the future and how it might affect deterrence. Lastly, it looks at the SDI and how it might affect NATO, particularly in light of the proposed Intermediate-Range Nuclear Forces treaty between the United States and Soviet Union.

## SCENARIO--"BOLT FROM THE BLUE"

The following scenario sets the stage for later discussion in this paper. Admittedly, it is probably far-fetched, but undoubtedly possible--if not by rational thought then irrational--similar to other irrational scenarios that are played out daily in real life.

THE KREMLIN--0615, 6 December 1991

Several old men were listening intently to General Polov Rodivonik, Commander-in-Chief of the Soviet Strategic Rocket Forces. "Mr. Secretary, the strike will succeed, but we must attack now, our forces have never been stronger." Gen Rodivonik sips his water and waits patiently as the general secretary of the Communist Party (CPSU) whispers to another member of the Council of Defense. Slowly, the general secretary pushes away from the table then stands up. "Comrades, the time is now!" He pauses for a moment, clears his throat, and looks directly at Gen Rodivonik. "Proceed with strike plan Marbella and start the dispersal of our reserve nuclear forces immediately." He then hesitates, thinks for a moment, clears his throat again, then asks, "Can our reserves be dispersed and safe prior to our attack hour?" Gen Rodivonik tugs on his ear and replies with a strong voice. "Yes, Mr Secretary, our attack submarines can clear their ports by early afternoon. Our SS-24 and

SS-25 forces can be dispersed prior to launch time. They can start movement within two hours of alert and can be in their dispersal positions four hours later." "Marshall Yadnov," orders the General Secretary, "Begin the dispersal of our other forces. We will attack today!" Marshall Yadnov, the recently appointed Minister of Defense looks up from his papers and replies, "I will start the deployment sequence now." He then motions to the Chief of the General Staff to join him at the table.

Uzhur, Soviet Union--1856, 6 December 1991

Buried some 120 feet deep in a forested area south of Uzhur, an SS-18, waited patiently in its berth as commands from the silo control center were sorted, digested, and compared with the pre-programmed data that was fed into its brain some months before. On the upper end of the missile, ten Multiple Independently Targetable Reentry Vehicles (MIRVs) were nestled closely together. Each appeared identical, the only difference was internal to their guidance system where the targeting data had been programmed some months before. All of the warheads on the missile were programmed to strike a variety of military and industrial targets in the Colorado Springs area just south of Denver, Colorado. The ten warheads plus the warheads from two other Intercontinental Ballistic Missiles (ICBMs) will rendezvous in space some 800 miles north of Denver and then start their fiery plunge

to their individual targets. All warheads were programmed to impact simultaneously over their targets at 0228 hours Colorado time, 0428, Washington time.

Within the silo control center, the countdown to Armageddon moved forward with each passing second. The loudspeaker announced each multiple of ten seconds until the final 15 then continued, "...14,13,...3,2,1,0." At the two second mark, steam poured from the silo opening melting the surrounding snow momentarily hiding its lethal occupant. Moments later, flames belched from the silo enclosure, seemingly from the bowels of hell, and the upper one-third of the missile appeared among the churning, whitish grey smoke gushing from the missile chamber. Almost dreamlike, the missile emerged from the flaming cauldron and reached towards the heavens, slowly accelerating as gravity loosened its hold as it gained altitude. Lazily, the missile rotated 180° as it continued to accelerate toward its rendezvous in space with the other attacking missiles some 24 minutes later.

#### LAURENTIAN FAN--0130, 7 December 1991

When the message arrived, the "Murmansk" was drifting silently northward at 350 meters depth just off what is known as the "Laurentian Fan."<sup>2</sup> The Fan lies about 400 miles south of Newfoundland, just off the continental shelf, approximately 2000 miles East and slightly north of Washington, D.C. In more relevant terms, the "Murmansk" was located

only 10 minutes missile flight time from launch to impact over Washington D.C. of one of its 20, SS-N-20 missiles.<sup>3</sup>

Captain Yershenko, skipper of a 170m Typhoon-class submarine<sup>4</sup> was in the control room when the order to launch was received. After authentication of the launch order, he directed that the 2000 meter extremely low frequency antenna be retracted and stored. With that action complete, the submarine started maneuvering slowly and silently eastward to intersect the firing point grid at precisely the time of launch, 0400 Washington D.C. time for a time of impact of 0410. The mission profile called for 2 missiles targeted for the Washington, D.C. area, each with 9 MIRVs. The remaining 18 missiles were targeted for the Hampton Roads area in Virginia.

At precisely 0400, the two crosshairs on the navigation system moved into perfect coincidence just as the countdown reached zero. A loud muffled sound followed by a second one 5 seconds later announced the ejection of two of the missiles in their cocoons of pressurized air. The first missile broke the surface of the water in an explosion of bubbles and air followed closely by the missile engines igniting. Within ten seconds after launch, both missiles had penetrated the first cloud layer at 1500 feet and were racing to their respective targets.

NORAD HEADQUARTERS--0203, Colorado Springs, Colorado

Gen Jackson, Commander of NORAD, watched intently as

the lines on the giant board traced hundreds of Soviet warheads as they raced across Greenland and the North Atlantic.

"Gen Jackson, I have the Sec Def on the red line," exclaims LTC Ron Lipton, Gen Jackson's military aide. Gen Jackson clasps the phone firmly and says, "Mr. Bushnell, we have confirmation that the Soviets have launched a massive nuclear strike; we have counted over 1000 missiles inbound!" Gen Jackson pauses, then in a barely audible voice continues, "The first will impact in the Washington, D.C. area in 6 minutes or less!"

WASHINGTON D.C.--0406, 7 December 1991

"Mr. President! Mr. President, wake-up! Secretary Bushnell is on the red line! Mr. President, he must speak to you now! We are under attack!" The President sat up almost immediately, notes the time as 0406, and exclaims in a confused but angry voice, "My God Mike, calm down, give me the damn phone!" It is now 0407. The President queries the Sec Def, "What's the problem Ron?" "Mr. President!" exclaims the Sec Def, "The Russians have launched an all out missile attack; the first warheads will impact shortly! Our forces have been alerted and are standing by for instructions!" The President shakes his head trying unsuccessfully to clear the cobwebs and make sense out of what the Sec Def is saying. "Ron, are we sure that this is not just another computer foul-up?" There is a long pause and the



Sec Def replies hesitantly, "I...I don't think so, Mr. President, but we're checking." The President again glances at the clock, it is now 0408. "Ron, I'll meet you in the situation room, can you be here in 15 minutes?" "Yes, Mr. President, I'm on my way," exclaims the Sec Def. The President hurriedly dresses and leaves his bedroom at precisely 0409. The seconds continue to tick; any moment now the first warhead will explode over the Washington D.C. area.

## DETERRENCE FAILS

So the nightmare has begun, it cannot be stopped and the march to Armageddon draws shorter with each passing second. Some 4 minutes earlier, only 6 minutes into the crisis, the President was notified of the impending nuclear holocaust, and he has only minutes to clear his brain and make the most momentous decision ever made in the history of mankind. As he tries to cope with the enormity of the problem, seconds tick by as Soviet warheads streak across the polar icecap and the cold waters of the Atlantic.

Theoretically, the President has a choice even during the confused circumstances of the final moments before the first warheads explode over their targets. Realistically, however, in the desperate situation described, no rational decision seems possible. There is no time to think out the various options dictated by our nation's announced strategic nuclear policy. It is impossible to imagine what a President's response might be in such a circumstance. It seems unrealistic to expect that any man could make a rational decision of such magnitude in such a compressed time frame. Perhaps then, the President's only choice would be to wait, see what happens, and then he or his successor respond to whatever the prevailing circumstance might be after the devastation of the Soviet first strike. On-the-other-hand, the President may elect to carry out our country's promise to the Soviets as dictated by our announced strategic nuclear policy, even

during such a desperate situation as described in the scenario.<sup>5</sup>

As pointed out previously, the scenario is imaginative, probably far-fetched, but undoubtedly possible in the uncertain world of today. The purpose of presenting such a detailed scenario was two-fold. First, it calls attention to a frequently overlooked aspect of our country's strategic nuclear policy; i.e., Command, Control, Communications and Intelligence (C<sup>3</sup>I). Without a survivable system, all discussion on retaliatory strikes in response to a nuclear attack is meaningless. Secondly, and closely related to the first, it provides a worst case situation in which the SDI might provide a solution; i.e., either deterring such an attack or providing time for the Presidential decision making in the event deterrence fails.

A strong case can be made that without a robust and survivable strategic C<sup>3</sup>I system, nuclear weapons and strategic doctrine mean little unless we have the means to determine what is happening in the chaos of crisis or war. If the C<sup>3</sup>I system is robust and survivable, our leaders would be able to make decisions with reasonable assurance that their orders will be carried out precisely and faithfully in the event deterrence fails. Undoubtedly, it is important when studying our deterrence policy to treat C<sup>3</sup>I with the same importance as nuclear weapons and doctrine.<sup>6</sup> This is particularly true in a worst case situation in which the President might have 7 or less minutes reaction time in the event of a nuclear attack on the United States.

In a worst case scenario, one can question whether our strategic C<sup>3</sup>I systems could survive during a massive nuclear strike and provide our leadership with means to determine the extent of damage inflicted by the strike and then communicate retaliatory orders to our surviving nuclear forces.<sup>7</sup> If the answer is no, our entire deterrence strategy may fail.

This "bolt from the blue"<sup>8</sup> scenario is indeed highly unlikely but one that our military planners have long considered a possibility. Indeed, our nuclear forces have been designed to operate in an environment of near complete surprise. However, this presupposes that our C<sup>3</sup>I system is up to the task of providing direction to our forces once an attack begins. If we have some warning, a variety of steps can be taken to increase the survivability of our nuclear forces. For example, if we had strategic warning, bombers and supporting tankers, our Submarine Launched Ballistic Missile (SLBM) fleet and the post-attack C<sup>3</sup>I system aircraft could be postured by alert procedures to increase their survivability.<sup>10</sup>

As mentioned previously, the President's choices during the final minutes and seconds of a worst case scenario are severely limited. A deployed and effective SDI system may provide the President more time to think and react if the Soviet offensive forces do not grow substantially in response to a deployed SDI system. If the system is able to eliminate the majority of the sub-launched threat, the President would have about 30 minutes to react; i.e., the time it takes an ICBM to reach the United States. But more important,

the SDI would contribute to deterrence if the Soviet planner did not have the confidence that he could make a first strike and be successful in gaining a military advantage by either decapitating the U.S. C<sup>3</sup>I system or destroying a substantial portion of our nuclear forces.<sup>11</sup>

Before examining whether the SDI will be effective in a worst case scenario it is important to review where our country has been and where we are going in respect to our strategic nuclear policy. Equally important, what does our strategy mean as it relates to the described scenario in which deterrence has failed; i.e., our strategic nuclear policy has failed. The following section briefly examines the issues.

U.S. NUCLEAR POLICY  
AS IT RELATES TO THE SCENARIO

Since the late 1940s, the United States adopted a number of so-called policies to describe how we might use our nuclear capability. These policies have evolved over the years, however, the focus of each has centered on target emphasis which is usually defined as either countervalue (counter-city) or counterforce (counter-military capability).<sup>12</sup> This evolution was brought about by our efforts to adapt to changes in our technologies and military capabilities as well as responding to the growing threat posed by evolving Soviet capabilities. Today, our announced policy gives the President several options.<sup>13</sup> These options range from an all out nuclear attack that is capable of destroying the Soviet nation as a society to a selective attack, one that is less than all out and that is appropriate to the type and scale of the Soviet attack.<sup>14</sup>

The shift away from strategic deterrence based on a massive, all out attack against the Soviet population and industrial centers does not mean the objective of our nuclear doctrine has changed. On the contrary, deterrence remains the bedrock upon which our policy rests as it was from the beginning. Through the 1960s and 70s, our policy evolved toward an emphasis on a measured response commensurate with the level of Soviet aggression and resulted in what is known

as "Countervailing Strategy."<sup>15</sup> Secretary of Defense Harold Brown reported to Congress this policy in his FY 1981 Report to Congress:

Our countervailing strategy--designed to provide effective deterrence--tells the world that no potential adversary of the United States could ever conclude that the fruits of his aggression would be worth his own costs. This is true whatever the level of conflict contemplated. To the Soviet Union, our strategy makes clear that no course of aggression by them that led to use of nuclear weapons, on any scale of attack and at any stage of conflict, could lead to victory, however they may define victory. Besides our power to devastate the full target system of the USSR, the United States would have the option for more selective, lesser retaliatory attacks that would exact a prohibitively high price from the things the Soviet leadership prizes most--political and military control, nuclear and conventional military force, and the economic base needed to sustain a war.<sup>16</sup>

The FY 81 report goes on to tie the countervailing strategy with NATO's strategy of flexible response:

Thus, the countervailing strategy is designed to be fully consistent with NATO's strategy of flexible response by providing options for appropriate response to aggression at whatever level it might occur. The essence of the countervailing strategy is to convince the Soviets that they will be successfully opposed at any level of aggression they choose, and that no plausible outcome at any level of conflict could represent "success" for them,<sup>17</sup> by any reasonable definition of success.

Since 1960, there have been many other pronouncements and much heated debate over what our declared nuclear policy should be today and in the future. The thrust of most of the discussions and debate revolve around the theme of deterrence; i.e., create enough uncertainty in the mind of an aggressor

over his prospects of "winning" that they are deterred. If deterrence is the basis of our declaratory policy, the question crying out for an answer is, "What does it all mean once deterrence has failed?" In the described scenario the President does not have the benefit of time nor the brains of the many experts who developed our country's deterrence policy to help with his terribly important decision. So then, by our declared policy, what options does the President really have in a desperate situation such as described in the scenario? If he elects to launch a retaliatory strike, what are the targets; the empty silos that participated in the strike, the dispersed Soviet reserve forces, the dispersed and protected Soviet leadership? Or does the President direct our surviving reserve forces be retargeted to attack the Soviet cities and industries to ensure that Soviet society is punished for their transgression across the nuclear threshold. More important, what is to be gained by striking back faced with the reality that deterrence has already failed. Again, any option the President elects seems insane--by launching an attack against the Soviets at any level he fulfills our promise dictated by our failed deterrence policy. Additionally, the retaliatory attack would certainly invite further death, destruction and suffering by follow-on retaliatory strikes by the Soviets. By doing nothing, our country is still destroyed as a society based on the magnitude of the described attack. Obviously, it is a no-win game under our current nuclear doctrine with



the only hope being that deterrence will prevail and the unthinkable will never occur.

Another question that needs answering is whether the situation would be any different if an effective SDI system (as perceived by the Soviets) were deployed? Probably the answer would be that it depends on how effective the system is in providing a defensive shield against ballistic missiles. If it were 100% effective, it does not seem likely that the Soviets would initiate an attack such as described in the scenario--they could not achieve a military advantage--deterrence would prevail. However, what would happen if both the U.S. and Soviets possessed a less than perfect system? Would we be back to a situation as described previously; a situation in which deterrence could fail and all response options lead toward escalation by both sides. Obviously, any nuclear exchange at any level would cause unimaginable devastation and suffering on both sides. However, it is possible that even a less than perfect SDI system is better than none at all. This possibility assumes that the Soviets would not respond to the SDI by building up their offensive forces so they could overwhelm any defensive effort. Given the assumption, even a "leaky" system would create heightened uncertainty in the mind of Soviet planners about their ability to achieve their objectives.<sup>18</sup>

## WHY A STRATEGIC DEFENSE INITIATIVE

On the surface, President Reagan's Strategic Defense Initiative (SDI) speech of March 23, 1983 seemed to offer a hope and a promise that the people of our country and the world could live without worrying about the horrible consequences of a cataclysmic nuclear exchange between the two superpowers. It was heralded by many as a giant step away from the abyss of nuclear annihilation by enhancing deterrence or in the event deterrence failed protecting our population.

Ironically, President Reagan's argument for the SDI was not new or original. It was Premier Aleksei Kosygin in 1967 who first voiced the rhetorical question, "Would it not be better to save lives than to avenge them?"<sup>19</sup> At the time, Kosygin was defending the deployment of a Soviet antiballistic missile system. Obviously, the idea of a defensive system seems to be a good one. Who could possibly argue against an initiative that is defensive in nature and is meant to protect rather than kill. So why then, did we not pursue a SDI program in the late 60s if it was such a good idea? If you look back to the mid to late 60s, our country was faced with a rapidly expanding threat posed by Soviet missiles and our government concluded that it would be most difficult to build an effective missile defense system. Additionally, it was felt that if our country proceeded ahead in developing a ballistic missile defense, the Soviets

would respond by expanding their strategic missile force thus overwhelming any possible defensive system. It was clear that the expense of a defensive system would far exceed the cost of Soviet increases in their offensive missile forces. Faced with this prospect, it did not make sense to pour billions of dollars into a program that could easily be overwhelmed by a Soviet attack. Additionally, it did not seem warranted to continue major efforts to defend against a less significant threat; i.e., Soviet bombers. After considerable debate, the decision was made to disband our continental air defense system.<sup>20</sup>

During the same time frame, a theory was evolving that held that deterrence would best be served if both the United States and Soviet Union were mutually vulnerable to the other's attack. This theory was expressed in the Anti-Ballistic Missile Treaty (ABM) which prohibited the widespread deployment of an ABM system. At the time, it was anticipated that further agreements could be reached to first limit then reduce strategic nuclear forces.<sup>21</sup>

Our hopes for the future limitations and reductions of nuclear weapons were never realized. On the contrary, both the U.S. and Soviet strategic weapon stockpiles have grown substantially. Today the Soviets have about 10,000 deployed intercontinental strategic nuclear weapons (missile warheads and bombs) and the estimates show that by 1990 the figure will grow by approximately 2000.<sup>22</sup> Additionally, the Soviets have deployed a large radar near Krasnoyarsk

which constitutes a violation of the ABM treaty.<sup>23</sup>

Today, the situation is considerably different than the one our decision makers faced during the late 1960s and 70s. As the capabilities of both the Soviets and our forces changed over the years, doctrine developers recognized that nuclear weapons could not deter war across the spectrum of conflict and that nuclear war was indeed possible. Consequently, the doctrine began to evolve and recognized that the unthinkable horror of nuclear war was possible and a broad spectrum of responses must be developed to contend with any level of provocation. Additionally, as pointed out earlier, the Soviet offensive missile threat to the United States and our allies continued to grow during this period. This fact, coupled with strong Soviet research and development into SDI related technologies and deployment of a defensive system designed to protect against ballistic missiles created a strong motive for our country to reassess what we were doing and where we were going in response to the threat. Most important, during the last several years, several powerful new technologies were developed that offer hope that a reliable, survivable and effective SDI system can be developed and deployed sometime in the foreseeable future. President Reagan undoubtedly had all of this in mind when he called upon the scientific community to give our country the means of rendering the ballistic missile threat impotent and obsolete.

## THE STRATEGIC DEFENSE INITIATIVE

During a speech in March of 1983, President Reagan presented his vision and challenge for the future by posing the following question:

What if a free people could live secure in the knowledge that their security did not rest upon the threat of instant U.S. retaliation to deter a Soviet attack, that we could intercept and destroy strategic ballistic missiles before they reached our own soil or that of our allies?<sup>24</sup>

His announcement marked the first step toward realization of his ultimate goal; i.e., to make nuclear weapons impotent and obsolete. Today, the SDI has evolved into a substantial research program designed to examine several promising new technologies to determine if such a defense is indeed possible. It is believed that if such technologies prove to be feasible, the resulting defensive system would create a more stable and secure world.<sup>25</sup>

Secretary Weinberger laid out the objectives of the SDI program in a 1984 memorandum:

The ultimate goal of the SDI is to eliminate the threat posed by nuclear ballistic missiles and increase the contribution of defensive systems to U.S. and allied security. This program will be carried out with full consultation with our allies.<sup>26</sup>

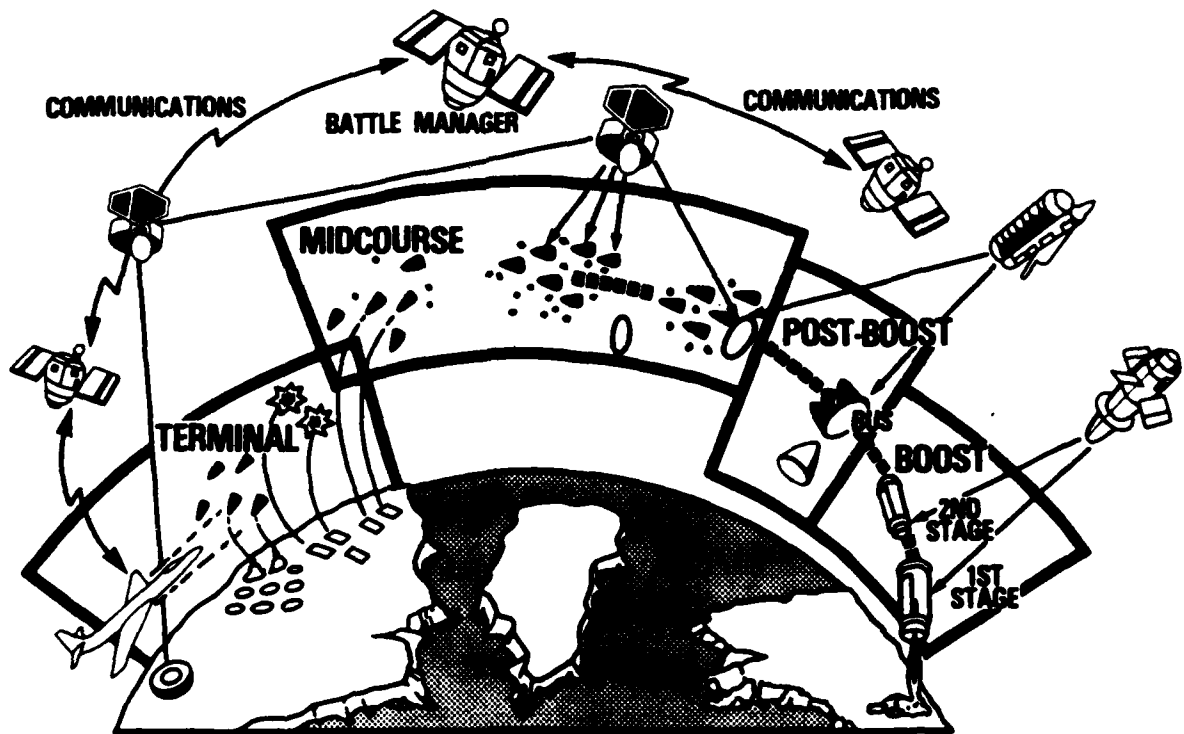
The defensive system President Reagan envisioned was described by former Defense Secretary Weinberger as providing an "astrodome" that would protect against the hard rain

of nuclear warheads.<sup>27</sup> Today, even the most ardent supporters of SDI, would probably agree that any future defensive system would be considerably less than perfect; certainly less than the near perfect defense originally envisioned. Matter-of-fact, many supporters of SDI would be willing to settle for a leaky system that would not protect American citizens but would protect U.S. silos, thus planting seeds of doubt in the Soviet leadership minds over the prospects of their success of a first strike. Even a leaky system is a long way from deployment and faces an uncertain future both from a budgetary and feasibility standpoint. Undoubtedly, it is many years away from achieving President Reagan's vision of a near impenetrable defense umbrella that would create a more stable and secure world.<sup>28</sup> Regardless, many think that the SDI will someday make the world a safer place.

As mentioned previously, the SDI program is currently nothing more than an extensive research program designed to test different concepts and technology to determine what is possible. However, it appears that the available technologies offer the possibility of a layered defense--a defense that attacks and destroys enemy warheads during all phases of their flight. This layered defense; i.e., attack of enemy missiles during boost, post-boost, mid-course and terminal phase would provide many opportunities to destroy attacking enemy missiles.

In seeking to determine the best defense against ballistic missiles, a team of scientists headed by Dr. James C. Fletcher

analyzed the characteristics of ballistic missiles during



Layered Defense Concept<sup>29</sup>

all phases of flight. In the boost phase, both the first- and second-stage engines of the missile are burning and its intense infrared signature is unique and relatively easy to observe. The post-boost phase is where the multiple warheads and accompanying decoys are released from the missile. In the midcourse phase, the warheads and decoys travel on a ballistic trajectory high above the atmosphere. In the final, or terminal phase of flight the warheads and decoys reenter the atmosphere.<sup>30</sup>

As pointed out previously, a defense in depth; i.e., a multi-tiered defense that attacks ballistic missiles during all phases of flight appears to be the best approach for solving the problem. This defensive concept accepts the fact that some missiles or decoys would be able to penetrate any one defense layer but would be challenged in each succeeding layer of defense. For example, if there was a "leakage" of 10% in each of the four tiers of defense it appears logical that you could construct a defense that has a cumulative effectiveness of greater than 99%. Using the scenario figures of 1000 incoming ballistic missiles and assuming that each, on average, has 10 MIRVs (warheads and decoys), only 1 warhead would survive through a 4 tiered defensive system. In the boost phase, only 100 would survive, however, in the post-boost phase this figure would increase 10-fold (to 1000) as the multiple warheads and decoys deploy from their buses. The 1000 warheads would then be reduced to 100 during the post-boost defense; the 100 surviving the post-boost would be further reduced to 10 during mid-course defense; and the remaining 10 would be reduced to 1 or less during the terminal defense.

The following is a description of how such a multi-tiered strategic defense system might actually work during the various phases of flight.

#### Boost Phase

The initial attempt to intercept an attacking missile would occur during the boost phase, the first 1-to-5 minutes of flight when the rocket engines



are still burning. During this phase, the red-hot exhaust flames of the rocket booster could be readily detected and precisely located by satellite-based sensors. Effective boost phase interception is a critically important element in a comprehensive defensive structure since the potential efficiency of the system is highest during this stage. Many Soviet missiles can carry ten or more warheads each as well as a quantity of decoys. Interception of a single missile in its boost phase, therefore, could destroy ten or more warheads and many more decoys at once drastically reducing the number of threatening objects to be identified and targeted by succeeding defensive layers. Boost phase components must attempt to locate, track, and destroy perhaps as many as several thousand missiles launched simultaneously--all within the first several minutes after enemy missiles have left their silos. American scientists have identified a group of technologies which may, individually or in tandem, eventually meet the requirements of the boost phase defense. These include several types of laser beams, the x-ray laser, the neutral particle beam, and a variety of kinetic energy technologies.

#### Post-Boost Phase

Those missiles that escaped the first defensive tier would be targeted again during the post-boost phase. Technologies under consideration for boost phase defense could be applied to this tier as well. During this 2-to-3 minute period, the warhead carrier--known as the "bus"--separates from the main rocket engines in order to release its warheads and decoys into their own separate trajectories. Early destruction of the bus would eliminate all warheads and decoys still on board. Because the colder flame of the warhead carrier's low-thrust rocket is harder to detect, target identification and location would become more difficult during this phase. Additionally, space-based sensors would

face the challenge of locating and tracking a proliferation of individual, separated warheads. The need to distinguish between decoys and actual warheads also would emerge during this phase.

#### Mid-Course Phase

The midcourse phase would provide a relatively long engagement time for targeting and destruction of those weapons that had survived the first two layers of defense. For approximately 20 minutes, surviving warheads and decoys would follow predictable (and hence easily targeted) paths as they coasted on their free-fall trajectories through space. The ability to discriminate between actual targets and perhaps hundreds or thousands of decoys--launched by the offense to attract interceptors and exhaust defensive resources prematurely--would continuously monitor threatening objects to ensure that all decoys were recognized as such. As with the previous defensive layers, kinetic energy armaments, several types of lasers, the neutral particle beam, and/or the x-ray laser device could be employed during this phase to intercept and destroy attacking nuclear weapons.

#### Terminal Phase

For those few weapons that had not yet been destroyed, a final attempt at interception would occur during their terminal phase of flight as the warheads reentered the earth's atmosphere. Terminal defense can either engage enemy warheads outside the atmosphere (exoatmospheric), or target reentry vehicles (RVs) within the atmosphere during the last two minutes of the vehicle's flight trajectory (endoatmospheric). Since the reentry period lasts only for 30 to 100 seconds, detection and targeting must be accomplished very quickly and with great precision. Because decoys and chaff would burn up or be greatly slowed as they reentered the

atmosphere, the remaining warheads would be relatively easy to detect. Airborne sensors could work in conjunction with ground-based radars during this phase to provide the final stage of interceptor guidance. Since enemy warheads might be designed to explode if approached by another object, interception and destruction should be accomplished whenever possible at the outer reaches of or beyond the atmosphere to avoid terrestrial damage. Much reliance might be placed on ground-based kinetic weapons during this final layer of the defensive effort.<sup>31</sup>

It appears that any defensive system currently envisioned, will be considerably less than the "near perfect" multi-tiered system described earlier. It will certainly be much less than the protective "astrodome" former Secretary of the Defense Weinberger described in the recent past.<sup>32</sup> Today, planners are willing to settle for a "leaky" system that will at least increase the survival chances of U.S. missile silos.<sup>33</sup>

Estimates vary, however, it appears that the very "best" SDI system possible for the foreseeable future would provide a cumulative protection much less than the 99+% described earlier in the paper. What then does this mean in relation to the growing Soviet threat? Again, going back to the scenario, assume that the SDI had been deployed by the U.S. and its cumulative effectiveness through all stages was 90% instead of the 99+% described earlier. Given this degree of effectiveness, out of the 1000 missiles launched by the Soviets, 100 warheads or decoys would still leak through the defensive shield which would undoubtedly cause terrible devastation and suffering.

The consequences of a single nuclear weapon exploding near or over one of our cities is beyond comprehension. Our experiences of the Second World War does not provide an accurate measure to what could be expected because today's nuclear weapons are so much more powerful; they have 3 to 50 times more explosive power than the bombs dropped over Hiroshima and Nagasaki. For example, it has been estimated that a 1-megaton bomb exploded over Detroit would kill approximately 500,000 people and injure 600,000 others. Similarly, a 1-megaton bomb exploding over Leningrad would cause approximately 900,000 deaths and over a million injuries. Obviously, the leakage of only 135 warheads would cause unprecedented destruction, death and suffering and would profoundly change our society as we know it today. Recovery would undoubtedly take many years and incalculable resources.<sup>34</sup>

It is important to note, that the 1000 missiles described in the Soviet nuclear strike scenario are only a fraction of the total strategic nuclear force the Soviets have targeted against the United States. One source estimates that the Soviets currently have 1398 land-based ballistic missiles with over 6000 warheads. Additionally, they have 1000 submarine-launched ballistic missiles with nearly 3000 warheads. The 1987 edition of "Soviet Military Power" gives the total of about 10,000 deployed intercontinental strategic nuclear weapons (missile warheads and bombs) and estimates that by 1990 the figure will be around 12,000.

It goes on to say that the Soviets have the potential to deploy between 16,000 and 20,000 strategic nuclear weapons by 1996.<sup>35</sup> Obviously, if the Soviets continue to increase their nuclear arsenal as projected, SDI will probably not be effective; i.e., an offensive attack would eventually overcome any defensive system that is possible or envisioned in the foreseeable future.

Obviously, SDI cannot move forward by itself and have any hope of succeeding in either the short or long run. Its development must be tied to negotiations to reduce nuclear arsenals on both sides or it is doomed to failure. An arms race involving both defensive and offensive means would prove extraordinarily expensive and would undoubtedly create instability if one side or the other was perceived as "getting ahead." Neither side has anything to gain in such an uncontrolled arms race and the possibility of war would certainly increase in such an unstable environment.

It appears that our country is faced with a dilemma. On-the-one-hand, the Soviets are moving forward in developing their own version of the SDI while strongly objecting to our efforts to do the same. The Soviets see our challenge as a serious threat to their huge arsenal of strategic nuclear weapons. On-the-other-hand, it seem that in order for the SDI to work, we must secure arms control agreements to reduce and limit offensive nuclear weapons. Consequently, in order to make the system work and operate effectively it will take an agreement on the part of the Soviets to limit

their offensive missiles.

Only the future will tell if the SDI will fulfill President Reagan's vision of a more stable and secure world; a world in which all people can live without the specter of a nuclear holocaust hovering over their heads. Dr. Edward Teller sums up this possibility for the future as follows: "I do know. We have to try. ...The only way not to succeed is not to try."<sup>37</sup>

## STRATEGIC DEFENSE INITIATIVE AND THEATER NUCLEAR WEAPONS

The SDI has had a profound affect on NATO. This is particularly true today in light of the recently signed Intermediate-Range Nuclear Forces (INF) treaty.

Prior to both INF and the deployment of Pershing II and the Ground Launched Cruise Missile (GLCM), there was a perception by many Europeans that with the advent of strategic parity between the U.S. and Soviets deterrence was weakened. There was also a questioning of the credibility of the American strategic commitment to respond to a Soviet nuclear strike in Western Europe. Consequently, it was believed that by deploying intermediate range nuclear forces (Pershing II and GLCMs) there would be a coupling of Europe with American strategic weapons. In-other-words, in the event nuclear war broke out, it would not be limited to the Central Front but would carry well beyond its border. Additionally, the Pershing II and GLCM would become essential components of the strategy of flexible response.<sup>38</sup>

The recent signing of the INF treaty has changed the whole nuclear equation in Europe and has triggered considerable debate both in our country and abroad. Jean-Bernard Raimond, was one of the first to declare publicly on the treaty. In a speech before the French National Assembly in November 1987, he stated, "American nuclear weapons must be maintained in Europe."<sup>39</sup> Many other Europeans share his concerns and are uneasy over the possible denuclearization of Europe. One of their concerns is brought about by the precarious state of NATO's conventional forces in relationship to Warsaw Pact forces.<sup>40</sup> Another concern about the INF treaty is

its impact on NATO's strategy of flexible response. By eliminating the Pershing and Ground Launched Cruise Missiles (GLCMs), NATO would be without "...a crucial escalatory option," according to former NATO Supreme Commander, Gen Bernard Rogers. Others within the European community do not share Gen Roger's view on the impact of INF on NATO's strategy of flexible response. They believe that as long as there are sufficient nuclear weapons in Europe the concept of flexible response would not be undermined.<sup>41</sup> Sir Geoffrey Howe reaffirmed this view recently by stating:

For our agreed policy of flexible response to be credible, an adequate nuclear capability is required, of certain variety and mix. But there is no magic in particular numbers of systems. We do not envisage fighting a battlefield or theatre nuclear war confined to Europe. And our concept of deterrence is not based on a predetermined progression through specific layers of nuclear escalation.<sup>42</sup>

Even with INF, there will still be thousands of nuclear weapons remaining in Europe. NATO alone will still have approximately 4,000 "battlefield" nuclear weapons; i.e., short-range missiles, artillery shells, and bombs delivered from aircraft. Additionally, both Britain and France have their own nuclear forces that play into the nuclear equation. Most important, there is the perception that there is a coupling of U.S. strategic, long-range nuclear weapons for the defense of Europe. However, even with NATO pronounced "first use" doctrine; i.e., nuclear weapons may be used to defeat or beat back a Soviet conventional attack is losing credibility.<sup>43</sup> "Opinion polls show that most West Europeans



oppose first use, even to prevent defeat, and NATOs own studies demonstrate that in an equal exchange of battlefield nuclear weapons, the west would lose the war faster than by conventional means."<sup>44</sup> (Bold print mine) Interesting to note, in light of the preceding thoughts, many Europeans are pushing for the so-called "third zero"--the negotiated elimination of all battlefield nuclear weapons.<sup>45</sup>

When the possibility of an INF treaty appeared likely, Gen Rogers became an outspoken skeptic of the proposal. In a 1987 interview with Army magazine he stated the following concerning the zero-level (INF treaty) proposal:

...In 1981, the President came out with the zero level proposal. Nobody expected the Soviets to agree. ...Then I came up on the net publicly saying that I thought this was a magnificent political ploy; but, militarily, it gave me gas pains.

The term "gas pains" has come back to haunt me ever since; and it still causes me that same problem because (1) it puts us right back where we were in 1979 with only the F-111 left to reach Soviet soil and too few escalatory options, and (2) the mission is to deter war not fight a war, and deterrence has to be in the mind of the beholder.

The Soviet Union must understand that the consequences of aggression by her are not going to be borne solely by the victims of aggression; she is going to suffer, too. When she saw us putting those Pershing IIs on our soil, which can reach the Soviet Union within 13 minutes flight time and can penetrate her defenses with certainty and great accuracy, she became very concerned because it put her in the same posture (in which) she's had the Western Europeans for all these years with all of the nuclear warheads in her inventory that can strike Western Europe--the same posture that the United States has been in with those submarine-launched ballistic missiles on Soviet subs just off our Atlantic seaboard with very short

flight time to the capital. The Soviets didn't like that posture, so she was out to capture the Pershing IIs, and now she has. I maintain that we have lost, therefore, a vital tool, namely theater nuclear weapons that can strike with certainty into the Soviet homeland by losing Pershing IIs.<sup>46</sup>

Gen Rogers makes a good point in that even with many tactical nuclear weapons remaining, only the F-111 has the capability of reaching Soviet soil. This capability can only be realized if the F-111 can be refueled and then penetrate several layers of Soviet air defenses. Disregarding the F-111, the only other theater nuclear capability (Not considering U.S., Great Britain, and French strategic weapons) available to the alliance are the short-range battlefield nuclear weapons. Going back to the comment made earlier, NATO's own studies show **"...that in an equal exchange of battlefield nuclear weapons, the west would lose the war faster than by conventional means."**<sup>47</sup> If this is true, it seems logical that the NATO leadership would not consider battlefield nuclear weapons as an escalatory option as part of their flexible response strategy. Their only rational options would appear to be negotiations, conventional means, or an escalation to strategic nuclear warfare. The theater nuclear strike option, particularly in the absence of the Pershing I and IIs and the Ground Launched Cruise Missiles (GLCMs) does not seem to be a viable option; i.e., to use them would invite a quicker defeat and a devastated Western Europe.

Where then, does the SDI fit into the theater picture? Assume that both the Soviets and the U.S. had deployed an SDI system that was perceived by both sides as "good" defenses; i.e., defenses good enough to deter the other side from initiating a first-strike. Also assume that the provisions of the INF treaty were adhered to by both sides and Europe was free from the threat posed by the weapons included in the treaty. On the surface, it would appear that the world would be a safer world than we know it today. On-the-one-hand, you have for all practical purposes strategic missiles on both sides that are impotent and obsolete; i.e., the other side would not use them because they are deterred. On-the-other-hand, the most dangerous nuclear weapons within Europe are destroyed as a result of the INF treaty. A strong argument can be made that a world such as this would indeed be safer, at least from the standpoint of a nuclear conflagration that could destroy Europe and possibly the world. It seems logical that if both sides were deterred at the upper end of the spectrum of conflict (Strategic nuclear war) because of a viable SDI defense, the only war possible would be a lesser war; i.e., unconventional, conventional or conventional war mixed with tactical nuclear exchanges limited to a geographical area. It seems that SDI would provide an umbrella under which these lesser albeit deadly wars could occur safely; i.e., without the danger of mutual assured destruction that has been the bedrock upon which our deterrence policy has

rested for many years.

Soviet theater military doctrine in the 50s and 60s emphasized the importance of being able to launch a substantial nuclear strike against NATO, or, at least be able to escalate quickly from a conventional to a nuclear strike.<sup>48</sup> For most of the post-war years NATO still had a substantial lead in nuclear weapons particularly those for tactical use on the battlefield. However, today the balance of nuclear weapons is different and Soviet military thought reflects this difference by envisioning a substantial initial phase of war free from the use of nuclear weapons. Soviet doctrine and technology both reflect this change of thinking and clearly indicate their wish to keep any theater conflict conventional--especially in the battle area--and to prevent NATO from exercising their nuclear strike options. Matter-of-fact, Soviet thinking speculates on the possibility of local wars between NATO and the Warsaw Pact confined solely to conventional weapons to include chemical.<sup>49</sup>

It appears that SDI and the INF treaty favor the Soviets in the European theater if in fact both sides are deterred from using strategic nuclear weapons. As pointed out, Soviet doctrine today emphasizes the importance of a conflict remaining conventional while NATO's flexible response includes a possible nuclear response. Based on the earlier postulated assumptions and facts, the combination of SDI and the INF treaty make both strategic and battlefield nuclear responses non-options for NATO. On-the-other-hand, the Soviets, with their numerical

superiority in manpower, conventional weapons and a doctrine emphasizing the necessity of winning quickly (before nuclear weapons can be brought to bear or NATO can fully mobilize), seem to give them a marked advantage given both SDI and the INF treaty.

### CONCLUSIONS

On the surface, it appears that SDI may not be the panacea that many of its supporters espouse. Admittedly, a "perfect" SDI would probably act as a strong deterrent if all other factors remained constant. After all, who could possibly argue against a defensive system provided by a near impermeable shield; a shield that would indeed make ballistic missiles impotent and obsolete. However, it appears that any SDI system deployed in the foreseeable future would be a "leaky" one and could easily be saturated by a strong offensive attack. Additionally, the SDI would not protect against other nuclear systems; i.e., aircraft carried bombs, cruise missiles, etc. On-the-other-hand, even a "leaky" system would probably enhance deterrence from the standpoint it would create uncertainty in the mind of an aggressor over the prospects of a successful first-strike. Obviously, only the possessor's of the SDI system would thoroughly know and understand its full capability and only a nuclear exchange would test its true effectiveness. Given the above, it seems unlikely that either side would

dare risk a first-strike; such an attack would be a step into the unknown and would surely invite the possibility of a devastating counterattack. This seems to be the most compelling argument for developing the SDI particularly in light of an intensive effort by the Soviets to develop their own defensive shield.

SDI's impact on the conventional balance of forces between NATO and the Warsaw Pact appears to be significant. If the superpowers are deterred at the upper end of the conflict spectrum as a result of SDI, wars less than strategic nuclear appear safer thus increasing their probability of occurrence. Today, the balance of forces between NATO and the Warsaw Pact is thought by many to be overwhelmingly in the Warsaw Pact's favor. In light of NATO's current political and fiscal situation, it appears that this imbalance could widen in the years ahead if the Soviets continue to increase their forces as they have in the past. However, during the last few months, there seems to be a growing willingness on the part of the Soviets to participate in conventional force reductions. Regardless, history clearly shows that when the balance of force tilts heavily in favor of a particular country or ideology, war often follows even though the weaker side attempts to avoid war by all costs. However, they are often drawn into a conflict by the very fact that they are weak and the aggressor leaves no choice but war itself.

Does this mean that SDI makes war inevitable at levels of war less than strategic nuclear? Of course, we can only

guess about what the future holds. However, it is imperative that the U.S. and NATO countries look to the future, look well beyond the deployment of the SDI, then proceed with a common will and purpose to insure that deterrence prevails at all levels of conflict. This can only be accomplished by enlightened leaders willing to look beyond the political expediencies of the present and make calculated decisions based on what is best for the Alliance in the long run. By doing this, the transition to a more stable and secure world as envisioned by President Reagan may become more than a dream with peace prevailing into and beyond the twenty-first century.

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